UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,582	11/24/2003	Yakov E. Kutsovsky	02019CON	5049

7590 12/04/2007

Michelle B. Lando
157 Concord Road
Billerica, MA 01821-7001

EXAMINER	
WARTALOWICZ, PAUL A	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
12/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/720,582	KUTSOVSKY, YAKOV E.	
	Examiner	Art Unit	
	Paul A. Wartalowicz	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 9/24/07 have been fully considered but they are not persuasive.

Applicant argues that Rohr fails to teach that the stream of liquid feedstock is atomized by injection into the stream of combustion gas.

Rohr is not relied upon to teach this limitation. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Hawtof is directed to a method of making fused silica and not fumed metal oxide particles and that the methods of making each are very different and therefore a person of ordinary skill would not look to fused silica for guidance regarding fumed silica applications. Applicant cites "Kirk-Othmer Encyclopedia..." to illustrate the distinction between fused silica and fumed silica.

However, it appears that the method of making fused silica is similar to that of fumed silica for the steps of oxidation or hydrolysis in a flame or plasma ("Kirk-Othmer Encyclopedia...", page 413). The difference in methods is when silica is formed and how it is processed after it is collected. In the instant specification, the silica produced is quenched (page 7), whereas in "Kirk-Othmer Encyclopedia...", the silica produced is consolidated when collected on a substrate (page 414). One of ordinary skill in the art

would recognize that the process of producing the fused silica by combustion in a flame would be substantially similar as that of the fumed silica. Therefore, one of ordinary skill in the art would combine Hawtof and Rohr as set forth in the rejection.

Applicant argues that Hawtof does not require that the liquid feedstock is atomized prior to atomization.

However, the liquid reactant can be delivered into the flame of the burner as an atomized liquid as cited by applicant. This meets the limitation of the liquid feedstock being atomized prior to combustion.

Applicant argues nothing in Hawtof teaches or suggests that the liquid feedstock is atomized by injection into that stream of gas (which indicates that the liquid feedstock can be fed to the nozzle under pressure that ensures that the it is injected into the stream of combustion gas with sufficient force to atomize the liquid feedstock.

However, the claim recites that the injecting the feedstock into the stream of combustion gas atomizes the liquid feedstock. The claims do not require that the injection itself is responsible for the atomization or the kinetic energy of the combustion gas. Hawtof teaches that the kinetic energy of the carrier gas is sufficient to atomize the liquid feedstock. Therefore, injecting the feedstock into the carrier gas atomizes the feedstock.

Applicant similarly argues that Blackwell is sufficient in the same manner as Hawtof.

However, the remarks above regarding Hawtof are reiterated here with respect to Blackwell.

Applicant argues that the Lewis patent does not disclose atomization by injection into the stream of combustion gas as required by the pending claims.

However, Lewis is relied upon to teach precursors used in the method of preparing metal oxides, not atomization by injection into the stream of combustion gas. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 7-10, 13-14, 17-18, 20, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rohr et al. (5340560) in view of any one of Hawtof et al. (6565823), Blackwell et al. (6312656), or Pearson et al. (4857076).

Rohr et al. teaches a method of making fumed silica which includes feeding a silicon precursor material and oxygen and hydrogen into a combustion chamber (Column 2, lines 10-27). Rohr et al. teaches that the precursor may be silanes or organosilanes (Column 2, lines 27-33). Rohr et al. teaches the use of pre-heated air (Column 3, line 29) and also that air is used to quench (Column 3, lines 40-41).

With respect to claims 25-30, the product claimed therein appears to be met by the teachings of Rohr et al. because Rohr et al. teaches the claimed process and therefore would appear to inherently teach the product that results from that process. The product of Rohr et al. would appear to inherently meet the claims regardless of whether the specific formula disclosed is taught by the reference.

Rohr et al. fail to teach providing a stream of a combustion gas having a linear velocity that atomizes and combusts or pyrolyzes the liquid feedstock.

However, Hawtof et al. teach a method for making silica (abstract) comprising atomizing the siloxane feedstock with kinetic energy of a flowing gas stream of nitrogen and oxygen at a high velocity (col. 8, col. 10).

Blackwell et al. teach a method for making silica (abstract) comprising atomizing liquid siloxane feedstock with high velocity nitrogen and oxygen gas stream (col. 9, 11, 12).

Pearson et al. teach a burner nozzle for admixing a slurry and an oxygen containing gas (col. 1) comprising an admixture to be reacted at a sonic velocity for the purpose of atomizing the admixture (col. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a gas stream of high velocity to atomize the precursor in Rohr as the advantages of a high velocity stream in contact with a feed stream to atomize the feed stream are well known in the art as taught by any one of Hawtof et al. (col. 8, col. 10), Blackwell et al. (col. 9, 11, 12), and Pearson et al. (col. 2).

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rohr et al. (5340560) in view of Lewis et al. (5075090) and any one of Hawtof et al. (6565823), Blackwell et al. (6312656), or Pearson et al. (4857076).

Rohr teach a method of making fumed silica as described above.

Rohr fails to teach the claimed precursors of claims 11 and 12.

Lewis et al. teaches a process of preparing a metal oxide by introducing a precursor which can be mixed with a carrier into a combustion zone and combusting in support of a gas to produce the particles (see abstract). In particular, Lewis et al. teaches that the preferred precursor materials are organometallic compounds wherein the R groups are alkyl, alkoxide, or mixed alkyl or alkoxide and especially those with 1-6 carbons (Column 3, lines 7-23), and further teaches specifically that dimethyldimethoxysilane can be used and that it can be used in conjunction with aluminum triethyl (see Example 5 in Column 7). The disclosure of Lewis et al. makes

numerous references to the use of aluminum triethyl and combined with the general teachings wherein the R groups of the precursors especially have 1-6 carbons, it would appear that this teachings is sufficient to anticipate at least the claimed precursor trimethyl aluminum since trimethyl aluminum is just the lower adjacent homolog of triethyl aluminum. However, should this teaching not be sufficient to anticipate the claims limitations, the claimed precursors would at least be obvious in view of the above cited teachings of which organometallic precursors are preferred.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the precursor trimethyl aluminum in Rohr et al. because Lewis et al. and Rohr et al. are drawn to substantially similar methods of making metal oxides and the precursor triethyl aluminum is clearly suggested by the teachings of Lewis et al.

Claims 1-6 and 13-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (6887566) in view of any one of Hawtof et al. (6565823), Blackwell et al. (6312656), or Pearson et al. (4857076).

Hung et al. teaches (Column 2, lines 7-53 generally) the production of metal oxide (ceria) by atomizing a ceria precursor which may be mixed with an alcohol (Column 2, lines 55-59) into a high temperature reaction zone such as a flame which can be made from a mix of fuel such as hydrogen or methane and oxidant such as air or oxygen (Columns 3-4, lines 66-14) to form the metal oxide particles (see also Column 4, lines 47-55) and that the product can be quenched with a cooling gas, atomizing liquid,

or through cooling tubes (Column 5, lines 6-10). Hung et al. also teaches that any of several well-known atomizing means can be used at various locations (Columns 3-4, lines 49-17).

Hung et al. fail to teach providing a stream of a combustion gas having a linear velocity that atomizes and combusts or pyrolyzes the liquid feedstock.

However, Hawtof et al. teach a method for making silica (abstract) comprising atomizing the siloxane feedstock with kinetic energy of a flowing gas stream of nitrogen and oxygen at a high velocity (col. 8, col. 10).

Blackwell et al. teach a method for making silica (abstract) comprising atomizing liquid siloxane feedstock with high velocity nitrogen and oxygen gas stream (col. 9, 11, 12).

Pearson et al. teach a burner nozzle for admixing a slurry and an oxygen containing gas (col. 1) comprising an admixture to be reacted at a sonic velocity for the purpose of atomizing the admixture (col. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a gas stream of high velocity to atomize the precursor in Hung et al. as the advantages of a high velocity stream in contact with a feed stream to atomize the feed stream are well known in the art as taught by any one of Hawtof et al. (col. 8, col. 10), Blackwell et al. (col. 9, 11, 12), and Pearson et al. (col. 2).

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (6887566) in view of Lewis et al. (U.S. 5075090) and any one of Hawtof et al. (6565823), Blackwell et al. (6312656), or Pearson et al. (4857076).

Hung et al. teach the production of metal oxide as described above.

Hung et al. fail to teach the claimed precursors of claims 11 and 12.

Lewis et al. teaches a process of preparing a metal oxide by introducing a precursor which can be mixed with a carrier into a combustion zone and combusting in support of a gas to produce the particles (see abstract). In particular, Lewis et al. teaches that the preferred precursor materials are organometallic compounds wherein the R groups are alkyl, alkoxide, or mixed alkyl or alkoxide and especially those with 1-6 carbons (Column 3, lines 7-23), and further teaches specifically that dimethyldimethoxysilane can be used and that it can be used in conjunction with aluminum triethyl (see Example 5 in Column 7). The disclosure of Lewis et al. makes numerous references to the use of aluminum triethyl and combined with the general teachings wherein the R groups of the precursors especially have 1-6 carbons, it would appear that this teachings is sufficient to anticipate at least the claimed precursor trimethyl aluminum since trimethyl aluminum is just the lower adjacent homolog of triethyl aluminum. However, should this teaching not be sufficient to anticipate the claims limitations, the claimed precursors would at least be obvious in view of the above cited teachings of which organometallic precursors are preferred.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the precursor trimethyl aluminum in

Hung et al. because Lewis et al. and Hung et al. are drawn to substantially similar methods of making metal oxides and the precursor triethyl aluminum is clearly suggested by the teachings of Lewis et al.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
November 30, 2007

/Steven Bos/
Steven Bos
Primary Examiner
A.U. 1793